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AUTOMATION AND YOU



Labour-Management Consultation Branch
Canada Department of Labour

CA1L35-69A71

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AUTOMATION AND YOU

**Labour-Management Consultation Branch
Canada Department of Labour
Ottawa, 1969**

The Queen's Printer
Ottawa, 1969
Cat. No.: L82-2069

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Automation and You—YESTERDAY

It is indisputably possible in the present era to refer to labour-management consultation committees with assurance that a satisfying percentage of any audience, without interpretations, definitions or embellishments, will understand the meaning of the phrase.

It is equally true that if you speak or write about a boat, whether it be the Queen Elizabeth II or a simple oar-propelled skiff, a reader or listener readily understands that you refer to a craft that can travel in water and transport humans, animals and material goods from point to point.

In 1947, according to best available reference works, it was as simple to define the word "automation" as it is today to define the phrase, "labour-management consultation committee," or the word, "boat." In that year, John Diebold, of the Harvard Business School, and D. S. Harder, of the Ford Motor Company, "coined the word 'automation' as a natural shortening of the word automatization," according to the *Encyclopaedia Britannica*.

Originally the word was largely associated with automatic production techniques and self-activating machines used in factories. One such machine was capable of moving automobile engine-blocks from station to station on an assembly line without human intervention. In that original concept, automation could be defined in very simple terms, that is, improved automatic machinery.

In New Context

After 1954 the word was in common usage, but no longer restricted to its original, comparatively simple meaning. In its new context it was used to describe almost everything known to mankind that could engage in some automatic process or motion —

from the automatic washing machine to the guided missile — and began to have what any Hollywood impresario of the 1920's would have delighted in describing as a stupendous, gigantic and colossal effect upon society's thinking and planning.

Although some communicators of the era grossly misinterpreted the significance of the possibilities inherent in the word automation in its new context — some went so far as to predict that in the very near future machines would be operating humans instead of vice versa — the majority remained stable; but the facts and figures they provided were indeed startling.

With unexpected suddenness, humans found themselves in the midst of a new technological era frequently referred to as the Second Industrial Revolution. Through progress in electronics, medicine, physics, mathematics, chemistry and the other related sciences that developed during and after the Second World War, many things that had been considered experimental — if not completely visionary and perhaps preposterous — had become very tangible realities that could dramatically affect the life of every human, favourably or adversely depending on how they were implemented.

Early Improvements

Some of the early examples advanced to show the improvements that could be made with machines were as follows: an automobile plant could with its new machinery produce in 14½ minutes from rough castings an engine block that had previously taken 24 hours to produce.

In 1908, a skilled sheet metal worker required eight hours to form the upper half of a fuel tank: now automated stamping machines can do the job in 20 seconds;

At a radio manufacturing plant, two men could produce 1,000 radios in a day, a task that before automation required the efforts of 200 employees.

A chemical company, using a computer, solved a problem in 30 hours. A human being, working 40 hours a week, would require 20 years to produce an answer to only the arithmetic involved;

Another computer, at Princeton University, could work out weather predictions in three hours, a task that would keep one human with an adding machine busy for 300 years.

In another branch of the electronics field, it was possible to place a glossy photographic print in a wirephoto machine in Ottawa, press a button, and get the print reproduced in Vancouver within a few minutes.

An individual in Vancouver could write on a teletype machine, and through electronic control have the written message emerge from a linotype machine in Ottawa, in metal slug form ready for use in the newspaper publishing process.

Some Insight

Multiply the few foregoing examples by several thousands and you will have a conservative estimate of the number of new machines and processes — all designed to speed up productivity in one form or another — immediately available for use in Canada and all the other industrialized nations.

Becoming aware of the significance of the new trend and the impact it could have on their existence, workers in every enterprise became alarmed about their future prospects. If machines could do the bulk of the jobs in factories and offices, in transportation and communications and all other fields of enterprise, what was to become of the workers? That question posed a problem that required an immediate answer.

To solve the problem through discussion, probably the greatest number of labour-management-government consultation committees in the history of joint consultation went into session from coast to coast. From their deliberations certain concrete conclusions were reached.

All of the technological improvements available were essential in Canada if the country was to keep pace with advances in other industrial nations and thus maintain its position in world markets. It was apparent that research, new products, new processes and increased productivity were essential to Canada's ability to compete; if this was lacking, the country would face the

probability of watching the standard of living deteriorate. It was equally apparent that solutions to the problems would have to be achieved without damaging human values.

Crash Programs

It was recognized that obtaining the new machines essential to Canada's growth and stability was simple, but training staff to handle them was a different matter. Many "crash" education programs developed. Through the combined efforts of governments, educationists, management and labour, the level of technical education given to Canadian students was greatly increased; retraining courses and on-the-job training gradually prepared the work force to take over the new equipment and make it work for the good of the country — and the process is continuing.

Within a short period of time it became evident that Canadians were keeping abreast of the innovations but could not quite catch up with the rapidity of mechanical expansion. By the time one gap was closed another one was developing, and the process still continues.

However, to the credit of the Canadian effort must be recorded one very significant fact, and that is: through the most tempestuous years, the percentage of unemployed persons remained almost static, in spite of a perpetual increase in the size of the work force.

Thinking and planning during the years that have passed since the advent of the Second Industrial Revolution have changed drastically, for obvious reasons, and many of the innovations can be easily recognized in the following pages.

Automation and You—TODAY

In contrast to the technology of the "twenties" and "thirties," which stimulated requirements for semiskilled and unskilled workers, as a result primarily of the introduction of mass-production techniques, today's technology is creating the demand for better educated and trained manpower, for qualified people. This is a dominant characteristic of industry today — the increasing proportion of jobs that are complex and require higher levels of education and technical knowledge.

A second feature is the relatively rapid change in the nature of jobs, a rapidity that demands a flexibility and adaptability on the part of workers and a corresponding system of education and training that will enable them to keep pace with continually changing conditions.

These changes were referred to in the report of the Special Committee of the Senate on Manpower and Employment:

The products and skills that were in demand before World War II, or even 10 years ago, are frequently not those which are required today . . . There is the danger that today's young people will have been trained for yesterday's jobs, or that they will enter the labour market without adequate general education and vocational preparation. The general level of education has been rising, and apparently quite rapidly, but employment conditions are changing even more rapidly. Clearly, this has far-reaching implications for the effective utilization of our manpower resources in the future.

An Important Factor

Automation is an important factor in altering the industrial, occupational, and geographical structure of employment, and this change requires adaptation and mobility of resources. Industrially, there has been a shift in employment from the goods-producing

industries (such as manufacturing, agriculture and mining) to the service industries, and from "blue-collar" to "white-collar" occupations.

In 1951, one in six workers was in agriculture. In 1966, only one person in 11 was engaged in agriculture although agricultural output increased. The disappearing agricultural workers have gone mainly to the urban areas and to industry; and the picture has undergone considerable change here also. In 1961, white-collar workers¹ comprised 39 per cent of the total Canadian work force and manual workers² (those involved in industrial production) made up 35 per cent of the total. By 1966, the white-collar group had jumped to 43.5 per cent of the total, and the proportion of manual workers had risen to 36 per cent — a 1-per-cent increase.

Such is the influence of automation, for although the total number of manual workers increased by only 1 per cent in the five years prior to 1966, commercial, non-agricultural output per man hour increased by approximately 23.2 per cent. Fewer workers were turning out more goods and services, and fewer agricultural workers were turning out more farm produce.

New Understanding Required

While the numbers of those engaged in industrial production have declined, clerical, technical and professional staffs have increased, a fact that becomes more apparent as the degree of automation increases. In the production area, the skills and qualifications of workers are affected by the changing nature and content of jobs. The value of long, practical experience with materials and tools is being steadily diminished and replaced by the need for understanding of new production processes.

The workers most affected by advancing technology are: those who continue to be employed but whose job requirements have changed; those who must move to new jobs; those who become unemployed; and young workers entering the labour market

¹ Proprietary and managerial; professional and technical; clerical; commercial and financial.

² Manufacturing and mechanical; construction; labourers; and transportation and communication workers.

at a time when employment opportunities and job requirements are rapidly changing.

Technological change has tended to throw into prominence two broad aspects of labour-management relations — worker or job security and management rights. Security of employment is affected because unilateral action by management to improve production processes to build a more efficient organization, alter its product line, or otherwise to increase efficiency, is likely to result in employee dislocation in one or more of a variety of forms. These may include such severe dislocation as unemployment, skill redundancy, or a change in job location, with all the attendant economic and social consequences.

Must Take Full Advantage

Both labour and management are generally agreed that industry, to remain competitive — literally to remain in business — must take every advantage of technological advances. It is over the manner in which automation is introduced and over adequate protection for the worker that differences of opinion occur. And, as Mr. Justice Freedman noted in his report of the industrial inquiry commission on Canadian National Railways “run-throughs”: “fairness demands that the advantages of the program should not fall all on one side — the company’s — and its burden all on the other — the men’s . . .”

What then can be done by industry, all levels of government, and educational authorities toward solving the critical problem of adapting the work force to technological change? Dr. W. D. Wood, director of the Industrial Relations Centre at Queen’s University, gave an indication of the problem’s importance when he said: “. . . Our future economic expansion will depend even more on the quality of our human resources than on our capital and physical resources.”

In organizations that have established joint consultation committees, composed of labour and management representatives, the atmosphere is ideal for discussion of the implementation of change and measures of manpower adjustment. For although certain measures designed to alleviate the impact of automation on the workers may eventually be written into most contracts, these meetings

of labour and management representatives can often resolve many problems relating to automation before they become points of dissension at the bargaining table.

Forward-Looking Plan

This forward-looking approach was exemplified by one company's plan that was launched in 1966. The company, embracing some 30 national and international unions and 12,000 employees, introduced a joint management-union plan to deal with problems arising from technological and other changes. The scheme was a direct attempt to lessen the effects of change on the individual worker.

A notable feature was the \$5-million fund financed by the company and upon which those employees affected by automation, technological or other specified changes could draw. The company was to contribute \$400,000 a year until the fund reached the \$5-million mark, after which it was expected the interest would provide the \$400,000 annually.

A joint labour-management statement pointed up the responsibility of a company to remain competitive but also to demonstrate practical concern for the welfare of its employees: "It is intolerable for the majority who expect to benefit from change to ask the minority to bear the brunt of that change."

The plan was to be integrated with government programs of training and financial assistance and contributions to those programs to be made from the fund. In certain cases it would pay separation allowance and provide weekly living allowances to employees awaiting other jobs in the company. Other forms of assistance also would be available to employees affected by change.

A Progressive Step

The plan did not provide for union participation in management's decision to institute changes, nor for negotiation concerning change, but representatives from both sides considered the plan a progressive step toward offsetting the detrimental effects of technological change. An important feature of the plan was that it provided a permanent body of professional persons to deal with individual cases.

Another agreement, signed in 1962 between a company and its employees, established a fund to provide for worker dislocation, unemployment, severance pay, retraining, reallocation and other matters. It was stipulated that no expenditure should be made until completion of a revision of the unions' seniority clauses in order to facilitate reasonable mobility of workers.

Problem Met

In another instance, an agreement signed in the construction industry — an industry of high labour mobility — met the problem of maintaining security and welfare benefits and provided for portable pensions and group life insurance. These provisions, which were originally part of a collective agreement between some 500 employers and a number of construction unions, were extended by provincial decree to cover the entire industry within a radius of 15 miles of the Island of Montreal. The coverage now includes more than 7,000 employers and an estimated 44,000 construction workers.

Those agreements, all within the last *five* years, indicate the manner in which collective bargaining can meet technological change. In the future, the necessity for greater worker mobility may demand added measures for pension portability and for vacation and welfare provisions. It may even result in co-operation between and consolidation of unions to provide for greater labour mobility.

Opportunities to Forecast

The time lag between a firm's decision to introduce technological changes and their implementation usually provides an opportunity to forecast the effects of automation and to decide on measures to minimize its impact on employees.

Such a study falls exactly within the sphere of joint labour-management consultation in that the problem is viewed from both sides, thus facilitating the assessment of requirements. Adjustment measures will vary and may be multiple depending on the situation.

In its publication *A Declaration on Manpower Adjustments to Technological and Other Change*, the Economic Council of Canada states:

The provision of information as early as possible about anticipated change and its manpower implications is basic and preliminary to the carrying out of any manpower adjustment program. Such advance notice from employers must be informative about change having manpower implications, and should be as specific as possible in identifying those who are likely to be involved in such change.

To be effective as an initial step prior to the selection of actual programs of adjustment, advance notice must be given to the local union or unions, and to the joint labour-management committee (where it exists) and to the employees affected. Only then can the adjustment process be arranged through the co-ordinated efforts of the employer and the union or unions. When the adjustment to change requires the use of public programs, advance notice should also be given to such public authorities as required. Then, if necessary, steps can be taken in developing placement, training or retraining, mobility assistance, and other programs to ensure that employees receive whatever aid is required for their adjustment to other employment.

As Much as Possible

Although it is impossible to stipulate for all industrial situations what the period of advance notice should be, since so many varying factors are involved, there should be as much advance notice as possible, with a minimum of three months where changes of material significance are involved. The longer the period of advance notification, the easier it will be to arrange any adjustments that may be necessary. Equally important is the provision of new information as it becomes available.

Although it may be difficult to apply such minimum advance notice to change arising from a sudden curtailment of the production due to market conditions, it should definitely apply to all changes with manpower implications that result from technological innovations or changes in production or administration methods.

As previously mentioned, the earlier the advance notice, the easier it will be to plan adjustment measures and to implement one of the most effective methods of meeting change — attrition.

The object of this method is to create a balance between expected job displacement and the normal turnover of the work force by limiting the entry of new employees. Vacancies created

by attrition are then filled by members of the existing work force who might otherwise face layoff as a result of technological or other change. If a shortage of workers should occur, existing employees could be placed on overtime work or additional help could be hired on a temporary basis.

Reducing Losses

An important method of reducing loss of employment due to change is the inter-plant transfer, but this is dependent on a number of factors such as job training, mobility assistance, transfer rights, placement, and seniority practices. Lack of qualifications may hinder inter-plant transfers unless adequate training or retraining facilities are available. Seniority rules may also provide an obstacle to transfer, especially when change descends upon an entire operation. Where seniority becomes an impediment, labour and management should seek a solution that would answer the need for greater worker mobility.

Although the problem of transfer in multi-plant companies is less acute, it can prove complicated when workers are represented by different unions in different plants or where one union holds separate contracts for different plants. The matter of transfer rights, seniority rights within the new plant and seniority practices can also give rise to problems. All these factors ought to be resolved by co-operation between unions and management if necessary mobility is to be achieved.

Related Aspects

Many of the aspects directly related to technological change have been studied by Felix Quinet, Economics and Research Branch, Canada Department of Labour. Some of his observations* on the more pressing problems follow here:

Second to "national unity" and "biculturalism," technological change is perhaps the most frequently discussed problem today. Although there is a great variety of opinions as to what the term specifically means, there seems to be general agreement on at least two basic points: first, it is that the kinds of technological change we have experienced in the last decade have been intro-

* Quinet, Félix. *The Collective Agreement in Canada*. Ottawa. Canada Department of Labour. 1967. p. 34-51.

duced at a more rapid rate than those introduced in earlier years; second, it is that current technological change has far-reaching effects on industry's manpower requirements. In more concrete terms, the introduction of technological change in industry is generally associated with a substantial increase in the number of skilled, technical and professional occupations, and a slower growth rate for the semi-skilled and unskilled occupational groups.

One basic question must be asked at this point: If technological change, rapidly introduced, means that many workers, young and old, with little or much seniority, in good or poor health, with much or little potential, may rapidly become useless, how can the parties to collective bargaining design ways in which to cushion the effects of technological change on the labour force? Also, to what extent and in what ways are collective agreements today responding to technological change?

A General Question

The first question that has been asked is a general one and must be answered in general terms. It involves both the techniques of collective bargaining and industrial relations, and the substance of collective agreements as well. In a context of technological change, the techniques of collective bargaining are bound to be subject to significant changes. For it is one thing to negotiate at the bargaining table a short-term objective such as a wage increase, a higher overtime premium rate, or a more generous cost-of-living allowance. But it is an entirely different matter for labour and management to discuss and negotiate about the long-term employment effects that the introduction of technological change will have in a given plant or company.

During the negotiations involving short-term goals, the parties to collective bargaining usually use statistics as weapons designed to support predetermined positions, and research in these cases is directed at bringing together the statistics that will support those rigid positions. In other words, there is in these situations little, if any, problem-solving research. On the other hand, long-term problems such as those associated with the introduction of technological changes obviously cannot be solved by the strategic and superficial use of statistics. Here, as an illustration,

are some of the basic questions faced by both labour and management in a context of technological change.

New Occupations

What kinds of new occupations will these changes bring about? What will be the skill content of these new jobs? As a result, how many of the current jobs will become obsolete? What kind of training or retraining arrangements can be worked out in order to prepare the present employees to meet the new occupational requirements of tomorrow? Also, what steps can be taken to ensure the mobility of those employees who can no longer be employed at a given company or in a given area? It is quite obvious that such basic and important questions, if they are to be usefully studied and examined, call for more than short and usually tense bargaining sessions. In other words, they require new techniques and new channels for effective labour-management *consultation*, as distinct from labour-management bargaining. It is equally obvious that these fundamental questions call for answers that only long-term research and some sort of continuous consultation can provide.

Because some current and important labour-management issues call for consultation rather than bargaining in the traditional sense, there might, of course, be a temptation to believe that objective labour-management consultation should gradually replace collective bargaining as a way of determining working conditions. A word of caution against such an over-simplified and somewhat rosy expectation is perhaps in order here. Indeed, in our industrial relations system operating in an essentially private enterprise economy and in a context of free decision-making, tough-minded bargaining will always have a role to play.

Technological Change Impact

Turning now to the impact that technological change can have on the *substance* of collective agreements, here is what two prominent observers and analysts of the Canadian labour scene had to say:

. . . It does not seem to us too great an oversimplification to assert that one of the key effects of technological change in the immediate future will be to focus the attention of the parties, to a far greater extent than in the recent past, on questions of work

practices and job and worker security. We are now entering a third phase of bargaining, in so far as the content of agreement is concerned, and that phase will see the growth in relative importance of the so-called non-wage portions of the agreement: items dealing with pensions, supplementary unemployment benefits, work practices, work rules, training, seniority systems, and the like. These issues will rise as changes in production techniques destroy established job categories, radically modify job descriptions, and create entirely new occupational groups. They are issues that are much more effectively handled on an industry-wide or market-wide basis.*

To illustrate this statement, I can't think of any better example than the role of seniority provisions in a context of technological change. One of the ways in which to ensure the mobility of the worker whose employment is affected by technological change in a given plant is to make it possible for him to carry his seniority rights to another plant where he may obtain or seek new employment. Such an arrangement obviously calls for a widening of the seniority unit, but it also calls for the detailed analysis of seniority provisions, as they are applied in practice in the day-to-day life of the industrial establishment. There are two basic ways in which to look at seniority provisions in collective agreements. One way is to submit those provisions to a rigorous conceptual and statistical treatment, and to classify them according to the weight given to the factor "length of service" as compared with the weight given to other factors, such as "ability." For example, in our published study on Collective Agreement Provisions in Major Manufacturing Establishments (1963), seniority provisions on layoffs were classified and coded along the following lines:

- a) seniority is taken into account together with other factors;
- b) the senior employee is retained in employment provided his qualifications (or ability) to perform available jobs are equal (equivalent) to those of employees junior to him;
- c) the senior employee is retained in employment provided his qualifications (or ability) to perform available jobs are sufficient (normal, average, etc.);
- d) layoffs are on the basis of straight seniority.

* H.D. Woods and Sylvia Ostry, *Labour Policy and Labour Economics in Canada*. Toronto. The Macmillan Company of Canada Limited, 1962. p. 498.

It is certain that a classification of seniority provisions along these lines provides very valuable and even stimulating information. It is the type of information on the basis of which detailed research work can be conducted, and it is also the type of information that will be useful at the bargaining table to "win" a certain type of seniority provision.

Seniority Impact Provisions

However, one really wonders whether in a context of technological change, such statistical information can be really satisfactory to those who wish to answer more fundamental questions such as, for example: What is the full impact of seniority provisions on manpower utilization in a given industry or company? On labour mobility in a certain region or throughout a certain industry? Or, on the protection of older workers in a given plant or industry? Surely, there are key items — not necessarily written in agreements — such as labour and management attitudes and policies toward older workers: the types of jobs involved in occupational changes; the seniority units in the company, that must also be submitted to close examination if comprehensive and adequate information is to be provided. This strongly suggests that the research treatment, rather than the statistical treatment, must be applied if valid solutions are to be found to key industrial relations problems arising today, as a result of technological change. It is obvious that such important problems as the widening of the seniority unit calls not only for labour-management consultation at the plant level but also for inter-union and inter-company consultation, a procedure that would, to some extent, dislocate the traditionally plant-wide bargaining unit.

Of Great Assistance

More generally, it can be assumed that since the introduction of technological change often calls for a higher degree of labour mobility between bargaining units as well as within bargaining units, moves by labour and management to extend the scope of those units on an industry-wide or a company-wide basis in multiple-plant operation will greatly assist in meeting effectively the problem of technological displacement. Indeed, wider bargaining units will make it easier for the displaced worker to move

from plant to plant without losing his seniority-related rights, such as vacations, sick leave, and other accumulated benefits.

The considerations made above clearly show, it seems to us, that technological change is bound to have a significant impact on both the techniques of collective bargaining and industrial relations, and on the substance of collective agreements as well. At this point our second question should be asked: To what extent and in what ways are collective agreements today responding to the challenge of technological change?

It is very difficult indeed, on the basis of information available, to provide an adequate answer to this question. There are, of course, unquestionable signs that in some situations the parties to collective bargaining on this continent have responded to the challenge of technological change in a positive manner. There have been in the past several years several collective agreements that have focused on solutions to manpower problems created by technological change. What is significant is that some of these agreements were a product of joint labour-management research, often conducted with the assistance of representatives from the public.

There is, for example, the Long-Range Sharing Plan that went into effect on March 1, 1963 at the Fontana, California plant of the Kaiser Steel Corporation. This plant was developed over three years as a result of research conducted by a tripartite committee composed of company, steelworkers and public representatives. The Long-Range Sharing Plan is designed to promote employment and income security for production, maintenance, clerical and technical workers affected by advances in technology. I wish to refer briefly here to four important features of the plan. First, it provides for the establishment of a plant-wide employment reserve in which employees will be assigned to perform work functions throughout the plant. Such assignments, however, shall not be used to displace employees, avoid recall of laid-off employees or to reduce the hours of work below 40 a week. Second, the plan also provides for a short-week benefit for employees whose work week falls below 40 hours as a result of technological change. Third, there is also the provision that employees in the employment reserve who are down-graded because of technological change will be entitled to a *displacement differential*. Finally,

another very significant aspect of the Long-Range Sharing Plan is a formula whereby savings resulting from higher productivity generated by technological improvements, an economical use of materials, shall be shared between the employees and the company. The plan can, therefore, be described as a typical example of a settlement where labour and management have taken steps not only to cushion the employment effects of technological change but also to see to it that savings resulting from higher productivity will be shared between the employees of the company.

Significant Factor

We have just reviewed some signs that indicate that some unions and companies have responded in a constructive manner to technological change, and that technological change is recognized as a significant factor in the formulation of certain government policies. However, these signs, as encouraging as they are, still leave our general question largely unanswered. The question was: To what extent and on what ways are collective agreements today responding to the challenge of technological change? I would suggest here that if this question is to be usefully answered, a new research approach is needed in the field of collective bargaining. By new research approach, it is meant a shift from an analysis of documents only, to an analysis of documents supplemented by field research.

Perhaps the best way to illustrate the statement just made is to draw your attention to the fact that in our recent study of collective agreements in Canadian manufacturing industries, provisions referring to "technological change" could not be tabulated. Indeed, we discovered that the matters arising out of technological change were often dealt with in a variety of provisions that made no direct reference to technological change as such. Thus, a tabulation limited to the very few specific provisions that were found in this field would have conveyed a misleading impression as to the degree to which the institution of collective bargaining is responding to technological change. What this actually means is that a major development such as changes in technology cannot be examined in a study of collective agreements, based on documents only.

However, I should like to point out that during the preparation of the study, there were many provisions we examined that raised a number of questions in our minds with respect to technological change. I would like to single out for comment some of these provisions, while making clear at the same time that these provisions are by no means the only ones on which changes in technology could have a bearing.

First Example

Let us take seniority as a first example. Seniority provisions on layoff were found in almost all of the establishments covered by the study. Some of these provisions were formulated in this manner:

In the event of reduction of staff and rehiring of employees, seniority shall apply, provided the employee with the greater amount of seniority can satisfactorily perform the job he is assigned to, or can learn the job within a reasonable time.

This type of clause was, of course, classified as one that provides that the senior employees will be retained provided their qualifications (or ability) to perform available jobs are sufficient. However, what is the true meaning of such a seniority provision in a context of technological change?

Let us assume here that such a provision is in effect in a firm where an automated plating machine has been put in operation.* Before the installation of the machine, 39 men plated a given square footage of surface in one day. On the automated equipment, 23 men were able to load, unload and inspect the same square footage. However, several maintenance mechanics were subsequently required to be in attendance all the time to prevent or repair breakdowns. We could reasonably assume here that as a result of the installation of the automated plating machine, 16 of the 39 platers became unemployable as platers in that firm. As a result, these men could conceivably be exposed to layoff. Under the seniority arrangement outlined above, those of them with the

* This specific example of technological change is extracted from the report prepared for the Special Committee of the Senate of Canada on Manpower and Employment, by the Economics and Research Branch, Department of Labour, Ottawa (February 1, 1961). However, the discussion that follows on the application of the seniority provision is entirely hypothetical, and is only used to illustrate the number of questions that an analysis of agreement provisions leaves without an answer.

greater amount of seniority would be retained in employment if they could satisfactorily perform the jobs they would be assigned to, or would learn these jobs within a reasonable time. Let us however assume that the jobs to which the company assigned some of these displaced workers are the new maintenance jobs resulting from the installation of the automated machine. Let us also assume that those new maintenance jobs would have a higher skill content than the jobs the displaced workers formerly occupied, and as a result these workers would be incapable of satisfactory performance in the new jobs. It might also be assumed that because of advancing age, or deeply entrenched work habits developed over the years, these displaced workers would no longer have the mental alertness needed to learn the new jobs within a reasonable time. In these circumstances, what kind of protection would be provided through the seniority clause? What would be management and union policies followed in applying the seniority provision in these cases? And, in the provision itself, what would "reasonable time" really mean? Would "reasonable time" be defined by management alone? Or by both union and management? Also, in these cases of changing occupational requirements, would it be the policy of management to give an advance notice to the employees who may become affected by these changes so as to give these workers "reasonable time" to learn the new jobs to which they would be assigned? . . . One can immediately realize that these questions — as vital as they are — cannot be usefully answered on the basis of an analysis of collective agreements only. It is only through an analysis of agreements supplemented by field study that meaningful information could be supplied.

Other Pointed Questions

In the context of technological change, other pointed questions could also be asked in relation to seniority as a factor considered in promotion and transfer. Our collective agreement study indicated that in one half of the establishments surveyed, senior employees were to be promoted if their qualifications to perform jobs were "equal" (or equivalent) to those of employees junior to them. Here is an example of such a provision:

In cases of promotion . . . the skills, ability and efficiency of the employees shall be the governing factor and where these things are equal, seniority shall be the governing factor . . .

Again here, what would be the real meaning of equal ability as between senior and younger workers, in plants where senior workers — set in their habits and perhaps in their partly obsolete skills — would be competing for promotion with younger workers freshly graduated from recognized institutes of technology, and mastering the knowledge required for an effective performance in those jobs open for promotion? Furthermore, in these situations, what would be the attitude of a union toward technological change, a union whose membership would be in the upper age bracket? Or, what would be the attitude of a union with a younger membership toward displaced older workers? And what would be the attitude of management, naturally preoccupied with efficiency? These are other questions that require more than document-based research.

Retraining Provisions

Training or retraining provisions in collective agreements are also of great interest in today's context of technological development. However, the mere reading of a training or retraining provision in a collective agreement does not, cannot, provide enough information as to what impact such provision has on the skills of the work-force in any particular establishment. For example, when an agreement provides that employees will receive straight-time pay for time spent in an institute of recognized standing for the purpose of learning new industrial and production techniques, it is natural that those who read this provision may wish to know how is this provision applied. Which are the workers who benefit from it? How are these workers selected? The answers to these questions are, of course, not to be found in the agreement but rather in the establishment where the agreement applies.

Similarly, the mere reading of a management rights clause will not always provide information as to the degree to which in an establishment the prerogative of management to introduce new methods of production is reconciled with the acknowledged right of the union to discuss these new methods in advance of their introduction.

In the last part of my remarks, I have attempted to show that a valid and useful assessment of the impact of technological change on collective agreements — and vice versa — calls not only for

detailed analysis of collective agreements — as important as this analysis is — but also for a careful investigation of how collective agreement provisions function in specific and practical situations.

Throughout my remarks, I have devoted a great deal of attention to technological change as a development that is having dramatic and far-reaching effects on industrial relations and on the labour force. But technological change is also a major development through which our firms and industries and, indeed, our economy as a whole can effectively meet the challenge of increasing competition from foreign countries. It is, therefore, vitally important that the proper research techniques be applied to determine not only how the hardships that can result from the introduction of technological change can be cushioned, but also what adjustments can be brought to our industrial relations system so that technological change can become an instrument for economic expansion and increased human welfare.

In The Practical Field

From the foregoing examples, it is undoubtedly obvious that the principle of joint consultation as recommended and promoted by the Labour-Management Consultation Branch of the Canada Department of Labour has long since graduated from the theoretical to the practical field.

Automation and You

It must also be obvious at this point that neither technological progress nor the problems it creates can come to an early standstill. It is equally certain that Canadians must devote an ever-increasing amount of effort to the task of learning skills of increasing complexity if they are to keep abreast, or get ahead of the effects of the devices that they keep contriving.

In the progression of events, the Canada Department of Labour continues to serve the interests of all Canadians through the provision of imaginative leadership in the development and encouragement of industrial relations policies, programs and public understanding designed to sustain a dynamic equilibrium with Canada's goals and objectives and to implement such policies and programs in industrial areas under federal jurisdiction.

Dr. George V. Haythorne, former federal Deputy Minister of Labour, indicated in a recent address that technological change is a thing that is inevitable, whatever we may think of it.

In other words, call it automation if you wish, or refer to it as technological change, but rest assured that it is here to stay, and that the most benefit will accrue to Canadians if they work co-operatively with it and with each other.

Automation and You—TOMORROW

From scanning daily occurrences it must be obvious that it is impossible to predict with any degree of accuracy where automation will lead in time. However, some facts are available.

For example, the United States has sent a manned space ship around the moon.

Again, in the United States, robot-makers expect that by 1975 there will be 50,000 robots working in factories, doing without protest the tedious tasks that elicit endless grumblings from humans. At the present time, only a few hundred are in action, but indications are that an increase is inevitable.

At the present time, here in Canada, telecommunications systems exist that can send, if necessary, 50,000 words from station to station in one minute.

It must be apparent that control of innovations must be maintained at all times, otherwise a state of chaos could develop in the industrial world that would disrupt irreparably the lives of all.

For that reason, discussion before implementation is recommended and promoted by the Canada Department of Labour. The Labour-Management Consultation Branch endeavours to convince individuals that it is imperative in this automation era to remember that without consultation, through consultation committees, too much too soon can be as damaging as too little too late.

